

Application No. 09/521,639
Amendment F dated June 23, 2004
Reply to Office Action of March 10, 2004

REMARKS/ARGUMENTS

Applicants and Applicants' attorney express appreciation to the Examiner for the courtesies extended during the recent telephonic interviews conducted on June 9 and 22, 2004. As discussed in the first telephonic interview and confirmed in the most recent interview, the Examiner has agreed that claims 29-37 are patentable over the prior art of record and that the rejection of these claims will be withdrawn. The Examiner also indicated that Amendment "E" will not be entered because the newly added method claims contained in Amendment "E" raise new issues that would require a new search and, given the finality of the most recent Office Action, the Examiner does not have the necessary allotment of time to conduct a new search relative to those new claims. Accordingly, Applicants have agreed to file a Request for Continued Prosecution in order for each of the claims presented in Amendments "D" and "E" to be substantively examined.

Reconsideration and allowance for the above-identified application are now respectfully requested. Claims 29-67 are pending, wherein claim 29 has been amended and new claims 56-67 have been added.

I. REJECTIONS UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

The Office Action rejects claims 29-37 under 35 U.S.C. § 112, second paragraph, on the grounds that there is insufficient antecedent basis for the term "the optical fiber" in line 15 of claim 1. Accordingly, Applicants have amended claim 1 in order to address this objection.

II. REJECTION UNDER 35 U.S.C. § 102

The Office Action rejects claims 29-31, 33, 35 and 36 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,014,359 to Nagano.¹ As agreed to during the telephonic interview dated June 9, 2004, Nagano neither teaches nor suggests the combination of elements comprising the laser apparatus defined in claim 29. Among other things, it was agreed that Nagano neither teaches nor suggests a laser apparatus comprising a "linear polarizer" in combination with a "quarter wave plate" arranged so as to "block light reflected back toward the laser". Because claim 29 is deemed to be patentable over the prior art of record, it follows that claims 30-37 are likewise patentable since they depend from claim 29.

¹ Because Nagano is, at best, only citable under 35 U.S.C. § 102(a), Applicants do not admit that Nagano is in fact prior art but reserve the right to swear behind Nagano at some future time to remove Nagano as a reference.

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The Office Action rejects claims 38 and 46 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,434,669 to Tabata et al. In rejecting claim 38, the Office Action refers to the embodiment depicted in Figure 13 and concludes that every limitation recited in claim 38 is shown in this embodiment. In response, claim 38 does not merely claim the combination of a laser and a quarter wave retarder plate, as arguably (though merely "schematically") shown in Figure 13 of Tabata et al. Instead, claim 38 claims a laser apparatus comprising "a quarter wave retarder plate that is positioned with respect to the laser" in order to perform a specific function and achieve a particular result, neither of which are taught or suggested in Tabata et al. One function is to ensure that "light reflected back toward the laser [e.g., by an optical transmission system] has a linear polarization, after passing through the quarter wave retarder plate a second time, that is orthogonal to the linearly polarized light emitted by the laser". The result of the specific arrangement of the quarter wave retarder plate relative to the laser and the resulting function is "that light reflected back toward the laser that has a linear polarization that is orthogonal to the linearly polarized light emitted by the laser . . . does not couple back onto the oscillation mode of the laser".

For example, in the context of an optical transmission system designed to accurately transmit optical data, it is desirable to minimize or eliminate interference of the laser that may be caused by light that is reflected back to the laser by the optical transmission system. Failure to minimize or eliminate the effects of interference caused by near-end reflections can potentially alter the optical data stream sent by the laser to the optical transmission system, thereby reducing the ability to accurately generate and transmit a desired data stream. Claim 29 describes one way to minimize or eliminate the potential data degrading effect of reflected light (i.e., by including a linear polarizer in combination with a quarter wave retarder plate to block reflected light). Claim 38 describes another, simpler way to essentially accomplish the same thing (i.e., positioning a quarter wave retarder plate relative to a laser so that linearly polarized light reflected back toward the laser is orthogonal to the linearly polarized light emitted by the laser). Both are superior to systems that attempted to reduce interference by (1) beaming light into an optical fiber that was angled in order for the light to reflect away from the light source or (2) constructing a light source that included an optical fiber segment, or fiber stub, that makes abutment with the main optical fiber of an optical transmission system, for the reasons given in the background section (i.e., based on cost, size and performance).

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To argue that Tabata et al. teaches or suggests the specific arrangement of a quarter wave retarder plate and laser so as to achieve the function and result recited in claim 38 is to engage in improper hindsight, using the present application as a guide to gloss over and fill in the missing teachings not found in Tabata et al. Simply comparing parts, without rigorously analyzing how they work together to achieve a particular result, is inadequate. A better way to understand what Tabata et al. teaches is to determine the technical problem that is solved by Tabata et al. and then comparing it to the technical problem solved by the invention of claim 38. According to Tabata et al. the disclosed "measuring endoscope" device is designed "for measuring concavities and convexities" found in "intiors of organs of human bodies". Col. 1, lines 11-15. This device solves the problem of previous devices that "do[] not permit accurate measurement of surfacial shapes when the linear diffraction patterns are non-uniform in contrast due to colors, depths of concavities, etc. on the surfaces of objects to be measured". Col. 1, lines 49-54. Nowhere does Tabata et al. teach or suggest that light reflected back toward the light source from an optical transmission system is to blame for the difficulty in measuring surfacial shapes. Instead, Tabata et al. addresses this problem in Embodiment 5 shown in Figures 13-15, in part, by providing "a quarter wave plate for changing a phase difference between polarized components which are perpendicular to each other and to the light emitted from the light source unit 51". Because Tabata et al. does not recognize light reflection to even be a problem, Tabata et al. provides no solution to this problem, nor does Tabata et al. even purport to do so.

Instead of comparing how the Tabata et al. measuring endoscope works, as compared to the laser apparatus of claim 38, the Office Action simply superimposes the structural features recited in claim 38 (i.e., the laser and quarter wave retarder plate designed for use with an optical transmission system) with superficially similar elements shown in Figure 13 of Tabata et al. (i.e., the "light source unit 51" and "quarter wave plate 52" used in combination with the "polarization-maintaining fiber 18"). However, the Office Action fails to show how the "schematic diagram descriptive of Embodiment 5" shown in Figure 13 (col. 11, lines 66-67) teaches or suggests an arrangement between the light source unit 51, quarter wave plate 52 and polarization-maintaining fiber 18 that would perform the specific functions and result recited in claim 38.

In particular, the Office Action fails to show where Tabata et al. teaches or suggests a quarter wave retarder plate positioned relative to a laser (e.g., rotationally aligned with its optical axes at 45 degrees with respect to the angle of the polarization of the light emitted by the laser)

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so as to circularly polarize light emitted by the laser, as required by claim 38. The Office Action also fails to show where Tabata et al. teaches or suggests that light from the light source 51 is reflected back to the light source 51 by the polarization-maintaining fiber 18, let alone in a manner so that "light reflected back toward the laser has a linear polarization, after passing through the quarter wave retarder plate a second time, that is orthogonal to the linearly polarized light emitted by the laser", as recited in claim 38. Finally, and perhaps more importantly, the Office Action fails to show where Tabata et al. teaches or suggests that "light reflected back toward the laser that has a linear polarization that is orthogonal to the linearly polarized light emitted by the laser. . . does not couple back onto the oscillation mode of the laser". Most importantly, Tabata et al., in fact, fails to teach or suggest any of the specific functional aspects recited in claim 38, let alone all three in concert.

It is axiomatic that in order for a single reference to anticipate a claim under 35 U.S.C. § 102, not only must the reference show every element in a claim, but it must show the elements as arranged in the claim. MPEP § 2131. According to claim 38, the recited elements must not only be present but they must be positioned so as to perform the specific functions and result recited in claim 38, as discussed above. Tabata et al. clearly fails to describe an arrangement of elements that specifically or inherently performs the exact functions and result required by claim 38. Applicants point to the teaching in Tabata et al. of "a quarter wave plate for changing a phase difference between polarized components which are perpendicular to each other and to the light emitted from the light source unit 51" and also Figure 13, which illustrates the quarter waveplate with an adjustment angle θ . Col. 12, lines 4-7 (emphasis added); *see* Figure 13. Thus, the requirement of Tabata that the quarter wave plate be adjusted rotationally to generate a desired phase difference between the polarization of the output light indicates that it does not disclose the particular orientation of the quarter wave plate required to generate circularly polarized light as recited in claim 38.

Applicants further point to the teachings of Tabata et al. that "[t]he effect of Embodiment 5 remains unchanged even when the location of the quarter wave plate 52 is replaced with that of the polarization-maintaining fiber". Col. 12, lines 30-33 (emphasis added). In contrast to inherent interchangeability of such parts in the Tabata et al. device, swapping the position of the quarter wave retarder plate recited in claim 38 with that of an optical fiber forming part of an optical transmission system would fundamentally alter the function and result of the laser

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apparatus of claim 38 because it would (1) prevent "light emitted by the laser [to be] circularly polarized by the wave retarder plate so as to have a predetermined handedness before reaching an optical transmission system"; (2) prevent "light reflected back toward the laser" to "pass[] through the quarter wave retarder plate a second time"; and (3), contrary to claim 38, allow "light reflected back toward the laser" to "couple back onto the oscillation mode of the laser" (emphasis added).

In view of the foregoing, Applicants submit that claim 38 is neither anticipated by, nor obvious over, Tabata et al., either alone or in combination with any other art of record. Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection. Because claims 39-45 depend from claim 38 they are likewise patentable over the art of record for at least the same reasons.

Though claim 46 is different in scope compared to claim 38, it likewise claims "a quarter wave retarder plate positioned with respect to the laser so that:"

light emitted by the laser is circularly polarized by the wave retarder plate so as to have a predetermined handedness before reaching the optical fiber; and

light reflected back toward the laser by the optical fiber has a linear polarization, after passing through the quarter wave retarder plate a second time, that is orthogonal to the linearly polarized light emitted by the laser so as to not couple back onto the oscillation mode of the laser.

As discussed above, Tabata et al. fails to teach or suggests a quarter wave retarder plate positioned relative to a laser so as to (1) circularly polarize light emitted by the laser and (2) so that light reflected back toward the laser has a linear polarization, after passing through the quarter wave retarder plate a second time, that is orthogonal to the linearly polarized light emitted by the laser in order that (3) light reflected back toward the laser that has a linear polarization that is orthogonal to the linearly polarized light emitted by the laser does not couple back onto the oscillation mode of the laser. For substantially the same reasons given above with respect to claim 38, Applicants submit that claim 46 is neither anticipated by, nor obvious over, Tabata et al., either alone or in combination with any other art of record. Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection. Because claims 47-55 depend from claim 46, they are likewise patentable over the art of record for at least the same reasons.

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III. REJECTION UNDER 35 U.S.C. § 103

The Office Action rejects claims 38-55 under 35 U.S.C. § 103(a) as being unpatentable over Nagano and Applicants alleged admitted prior art and further in view of U.S. Patent No. 4,955,006 to Fukushima et al. In rejecting claim 38, the Office Action states that "Nagano discloses the claimed invention except for the lack of a linear polarizer" and then alleges that it would have been obvious "to remove the linear polarizer".

Before responding substantively to the rejection of claims 38-55, Applicants first wish to clearly establish the legal guidelines governing obviousness rejections under 35 U.S.C. §103. "In determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious". MPEP § 2141.02 (emphasis in original) (citing *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983)). Second, "[a] prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention". MPEP 2141.02 (emphasis in original) (*W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983, cert. denied, 469 US 851 (1984)). Third, "[i]f the proposed modification or combination of the prior art would change the principal of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious". MPEP §2143.01 (emphasis added) (citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)).

In response to the rejection of claim 38, Applicants point out that claim 38 does not "remove the linear polarizer" which, as discussed during the interview of June 9, 2004, is neither taught nor suggested in Nagano. Rather, claim 38 recites a laser apparatus that "does not include any polarizing element positioned between the laser and the quarter wave retarder plate" so that light reflected back toward the laser is "unimpeded by any polarizing element", including the "polarizing diffractive element" that is critical to the invention of Nagano (emphasis added). Because the Nagano device is an optical disk reader, it could not function as intended if one were to remove the "polarizing diffractive element" from between the laser and the quarter wave plate. As shown in Figure 1, relied on by the Office Action when rejecting claim 29, the "polarizing diffractive element", which is positioned between the laser and the quarter wave plate, is an essential feature of this and other embodiments because it causes light reflected back from the optical disk to be refracted toward photodiodes used to read and interpret the data on the optical

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disk. Entirely omitting the "polarizing diffractive element", as argued in the Office Action, would prevent light reflected by the optical disk to pass through the "polarizing diffractive element" as required by Nagano.

The "polarizing diffractive element" of Nagano is a necessary feature of the optical head, being responsible for its proper operation. See Title; Figures 2A, 2B, 5A, 5B, 8A and 8B; col. 1, lines 5-7; col. 4, line 27; col. 5, line 50; col. 7, lines 3-21; col. 8, line 24; col. 9, line 44; col. 10, lines 1-14. It would therefore be contrary to the teachings of Nagano to omit the required "polarizing diffractive element". Doing so would "change the principal operation of the prior art invention being modified". MPEP § 2143.01; *In re Ratti*. Because of this, Nagano teaches away from the laser apparatus recited in claim 38, which "does not include any polarizing element positioned between the laser and the quarter wave retarder plate" (emphasis added). See, MPEP § 2141.03; *Gore v. Garlock*. Thus, the express teachings in Nagano regarding the criticality of including a "polarizing diffractive element" positioned relative to the laser and quarter wave plate, as shown in the drawings, would lead one of ordinary skill in the art away from the modification of Nagano urged in the Office Action, notwithstanding whatever may allegedly be taught in the present application and/or Fukushima et al.

In support of its position, the Office Action asserts that omission of an element involves only routine skill in the art. However, according to MPEP § 2141.03 and *Gore v. Garlock*, a reference must be read for all that it teaches, including those teachings that would lead away from the claims at issue. Since Nagano requires the use of a "polarizing diffractive element" as shown in the drawings, and because Nagano would cease to function as an optical head reader, there would have been no motivation for one of skill in the art to omit the "polarizing diffractive element", let alone in order for light reflected back toward a laser to not couple back to the oscillation mode of the light emitted by the laser. More fundamentally, the inquiry made in the Office Action is misguided – the correct inquiry is not whether it would have been obvious to remove the "polarizing diffractive element" from the Nagano device, but when the invention recited in claim 38, as a whole, is obvious over Nagano in view of the secondary references. MPEP § 2141.02; *Stratoflex; Schenck*. The Office Action presents no such inquiry or showing.

As for the rejection of claim 46, the Office Action alleges that it would have been obvious to replace the optical disk of the Nagano system with an optical fiber. This allegation ignores the very essence of Nagano, which discloses and claims an "optical head". To omit the optical disk in favor of an optical fiber would render the "optical head" entirely useless for its

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intended purpose (*i.e.*, of reading an optical disk). Since the purpose of Nagano is to read data stored on an optical disk by capturing light reflected from the optical disk in a particular manner, Nagano provides no motivation for the "light emission and transmission system" of claim 46, which seeks to minimize or negate the effect of light that may be reflected back toward the laser by the optical fiber. Thus, whereas it is desirable and necessary for light to be reflected (*i.e.*, by an optical disk) in Nagano, the invention of claim 46 seeks to minimize or neutralize the effects of light reflected by the optical fiber. Claim 46 therefore claims an invention that is inherently incompatible with the intended function and operation of the optical head disclosed in Nagano. Claim 46 "change[s] the principal operation of the [Nagano] invention". *See MPEP § 2143.01; In re Ratti.*

IV. NEW CLAIMS 56-67

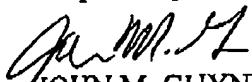
Applicant has added new claims 56-67, which are derived from the existing apparatus claims. Applicant has studied Nagano, Tabata et al. and Fukushima et al. and can find no teaching or suggestion for the specific method steps, functions, and results recited in claim 56. As such, Applicant respectfully submits that claims 56-67 are also patentable over the art of record for many of the same reasons given above with respect to the previously pending claims.

V. CONCLUSION

In view of the foregoing, Applicants submit that the claims as now presented are in allowable form. In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, or which may be overcome by an Examiner's Amendment, the Examiner is requested to contact the undersigned attorney.

Dated this 28th day of June 2004.

Respectfully submitted,


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